

AG Contract No.KR03-1408TRN
ADOT ECS File No. JPA 03-072
Project No : IM-10-D(002)A
Section: I-10, Sunland Gin Road
Tests for Ultra-Thin White Topping
TRACS No: H5244 01C
BUDGET SOURCE ITEM NO.: 19702

INTERAGENCY SERVICE AGREEMENT

FIXED-PRICE
NO. 03-1638

BETWEEN
THE ARIZONA DEPARTMENT OF TRANSPORTATION
AND
THE ARIZONA STATE UNIVERSITY

THIS AGREEMENT is entered into April 6, 2004, by and between the ARIZONA DEPARTMENT OF TRANSPORTATION TUCSON CONSTRUCTION (hereinafter called "Sponsor") and the ARIZONA BOARD OF REGENTS, acting for and on behalf of ARIZONA STATE UNIVERSITY, (hereinafter called "ASU").

RECITALS

WHEREAS the Sponsor is empowered by Arizona Revised Statutes Section 28-401 to enter into this agreement and has delegated to the undersigned the authority to execute this agreement on behalf of the Sponsor.

WHEREAS the ASU is empowered by Arizona Revised Statutes Section 15-1626 to enter into this agreement and has delegated to the undersigned authority to execute this agreement on behalf of the University.

WHEREAS Sponsor desires that ASU perform certain services as described in the scope of work attached hereto and incorporated herein as Exhibit A, and ASU desires to perform such services upon and subject to the terms and conditions hereinafter set forth.

NOW, THEREFORE, the parties agree as follows:

ARTICLE I. SCOPE OF WORK ASU shall use all reasonable efforts to perform the services and deliver any reports or other items specified in Exhibit A attached hereto.

ARTICLE II. PROJECT DIRECTOR ASU shall provide Barzin Mobasher, Department of Civil and Environmental Engineering as Project Director for work under this Agreement. The Project Director shall not be replaced without prior consent of Sponsor.

ARTICLE III. PERIOD OF PERFORMANCE. This Agreement shall begin on June 09, 2003 and shall terminate on June 15, 2004. This Agreement may be modified or extended at any time by mutual written consent of both parties.

NO. 26761
Filed with the Secretary of State
Date Filed: 04/06/04

Janice K. Brewer
Secretary of State

By: Darryl D. Harnewald

ARTICLE IV. SPECIAL PROVISIONS

1. **Compensation.** Compensation shall be on a firm-fixed-price basis. Sponsor shall pay ASU a lump sum amount of \$25,000.00 for ASU's services hereunder. Sponsor shall remit not less than fifty-percent (50%) of the total contract price upon execution by both parties of this Agreement. The remaining amount of the contract price due under this Agreement shall be paid upon receipt of invoices from ASU based on the following schedule:

<u>Milestone</u>	<u>Amount</u>	<u>Date</u>
Quarterly Payment	\$3,125	September 15, 2003
Quarterly Payment	\$3,125	December 15, 2003
Quarterly Payment	\$3,125	March 15, 2004
Final Report	\$3,125	June 15, 2004

Invoices are due and payable within 30 days.

2. **Publications.** Sponsor recognizes that under ASU policy the results of work performed under this Agreement must be publishable and agrees that ASU and its employees and students engaged in work under this Agreement shall be free to present at symposia or professional meetings, and to publish in journals, theses or dissertations, or otherwise of their own choosing, methods and results of the work performed under this Agreement. Upon written request by Sponsor, copies of proposed manuscripts will be furnished to Sponsor for review prior to publication. In no event will ASU delay publication for more than thirty (30) days from date of submittal of manuscript for Sponsor review.
3. **Notices.** All notices under this Agreement given by either party to the other shall be in writing and shall be sent by U.S. Postal Service, first class, facsimile or e-mail. Addresses are as follows:

For ASU: Office for Research & Sponsored Projects Admin.

Arizona State University
P.O. Box 873503
Tempe, Arizona 85287-3503
Phone: 480-965-0029

Ms. Karina Lugo
e-mail: Karina.Lugo@asu.edu
cc: Barzin Mobasher
Department of Civil and
Environmental Engineering
Fax: 480-965-8013

For Contracting:

Arizona Department of Transportation
Joint Project Administration
205 S. 17th Avenue, Mail Drop 616E
Phoenix, Arizona 85007
Fax: 602-712-7424

For Sponsor: Ligial Lluria

ADOT Tucson Construction
633 E. 22nd Street, Mail Drop T132
Tucson, Arizona 85713
Phone: 502-628-5603
Fax: 520-8385844

4. **Intellectual Property.**

a. **Inventions.** ASU and Sponsor shall own all rights, title, and interest in and to all inventions, discoveries, formula, processes or procedures first made or conceived or first reduced to practice by ASU personnel in the performance of work under this Agreement, and all patents or other proprietary rights thereto. If ASU and Sponsor decide to file a patent application or applications pertaining to the

work under this Agreement, Sponsor agrees to cooperate and assist ASU with the filing, as may be reasonably requested by ASU, and to maintain confidentiality of the results of the work as necessary to facilitate the patent application. All patents shall be filed in the name of or be assigned to ASU and Sponsor.

b. **Copyrights.** ASU and Sponsor shall own all right, title and interest in and to any and all copyrights or copyrightable material, including software programs, first produced, composed, or fixed in any tangible medium of expression in the performance of work under this Agreement, and ASU and Sponsor shall have the sole right to determine the disposition of all or any thereof.

5. **Confidentiality.** ASU shall not be responsible for the protection of confidential or proprietary information.

ARTICLE V. GENERAL PROVISIONS

1. **Entire Agreement.** This Agreement embodies the entire understanding of the parties and supersedes any other agreement or understanding between the parties relating to the subject matter. The parties agree that should any part of this Agreement be held to be invalid or void, the remainder of the Agreement shall remain in full force and effect and shall be binding upon the parties.
2. **Waivers.** No waiver, amendment or modification of this Agreement shall be valid or binding unless written and signed by the parties. Waiver by either party of any breach or default of any clause of this Agreement by the other party shall not operate as a waiver of any previous or future default or breach of the same or different clause of this Agreement.
3. **Assignment.** Neither party may assign any rights hereunder without the express, written, prior consent of both parties.
4. **Governing Law.** This Agreement shall be governed by and construed in accordance with the laws of the State of Arizona.
5. **Cancellation for Nonappropriations.** The parties recognize that performance by ASU depends upon appropriation of funds by the State Legislature of Arizona. If the Legislature fails to appropriate the necessary funds, or if ASU's appropriation is reduced during the fiscal year, ASU may reduce the scope of this Agreement if appropriate or cancel this Agreement without further duty or obligation. ASU agrees to notify Sponsor as soon as reasonably possible after ASU knows of the loss of funds.
6. **Conflict of Interest.** This Agreement is subject to the provisions of A.R.S. 38-511. The State of Arizona may cancel this Agreement if any person significantly involved in negotiating, drafting, securing or obtaining this Agreement for or on behalf of the Arizona Board of Regents becomes an employee in any capacity of any other party or a consultant to any other party with reference to the subject matter of this Agreement while the Agreement or any extension thereof is in effect.
7. **Independent Contractor.** ASU is an independent contractor and shall be free to exercise its discretion and independent judgment as to the method and means of performance of its work hereunder. ASU employees shall not be considered employees of Sponsor, and neither ASU nor Sponsor personnel will, by virtue of this Agreement, be entitled or eligible, by reason of this agreement, to participate in any benefits or privileges given or extended by the other party to its employees.

8. **Termination.** Either party may at any time terminate this Agreement by giving the other party not less than thirty (30) days prior written notice. In the event this Agreement is canceled by Sponsor, Sponsor shall remain responsible for payment to ASU for all work performed through the date of termination and for reimbursement to ASU of all non-cancelable commitments incurred in the conduct of the research. Non-cancelable commitments shall include employment commitments to ASU personnel through the end of the semester following any such termination by Sponsor. In the event ASU terminates this Agreement any unused funds from the advance will be returned.
9. **Arbitration.** In the event of any dispute, claim, question, or disagreement arising from or relating to this agreement or the breach thereof, the parties hereto shall use their best efforts to settle the dispute, claim, question, or disagreement. To this effect, they shall consult and negotiate with each other in good faith and, recognizing their mutual interests, attempt to reach a just and equitable solution satisfactory to both parties. If they do not reach such solution within a period of 60 days, then, upon notice by either party to the other, all disputes, claims, questions, or differences shall be finally settled by arbitration administered by the American Arbitration Association in accordance with the provisions of its Commercial Arbitration Rules.
10. **Insurance.** ASU maintains general liability insurance and worker's compensation coverage as required by state law and pertinent federal laws and regulations under the State of Arizona Risk Management Plan.
11. **Liability.** It is understood that neither party to this agreement agrees to indemnify the other party or hold harmless the other party from liability hereunder.
12. **Nondiscrimination.** The parties agree to comply with all applicable state and federal laws, rules, regulations and executive orders governing equal employment opportunity, nondiscrimination and affirmative action.
13. **News Release.** Sponsor may not use the name of ASU in news releases, publicity, advertising, or other promotion, without the prior written consent of ASU, except for documents used for internal consumption by Sponsor.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by its duly authorized representatives on the respective dates entered below.

STATE OF ARIZONA

ARIZONA BOARD OF REGENTS
FOR AND ON BEHALF OF
ARIZONA STATE UNIVERSITYBy: RANDALL W. DRAPER, PH.D.
Director, Research AdministrationDate: 2-4-04

ARIZONA DEPT. OF TRANSPORTATION

By: DOUGLAS A. FORSTIE, P.E.
Acting Deputy State EngineerDate: 03-26-04

PROJECT DIRECTOR APPROVAL

I have reviewed the terms of this contract and they are acceptable to me. I request that an authorized signatory execute this contract on behalf of the university.

By: 

BARZIN MOBASHER

Date: 1/30/04

JPA 03-072

APPROVAL ATTORNEY FORM FOR
THE ARIZONA STATE UNIVERSITY

I have reviewed the above referenced proposed intergovernmental agreement, between the DEPARTMENT OF TRANSPORTATION, INTERMODAL TRANSPORTATION DIVISION and the ARIZONA STATE UNIVERSITY, an agreement among public agencies which, has been reviewed pursuant to A.R.S. section 11-951 through 11-954 and declare this agreement to be in proper form and within the powers and authority granted to the ARIZONA STATE UNIVERSITY under the laws of the State of Arizona. No opinion is expressed as to the authority of the State to enter into this agreement.

DATED this 4 day of Feb 2004

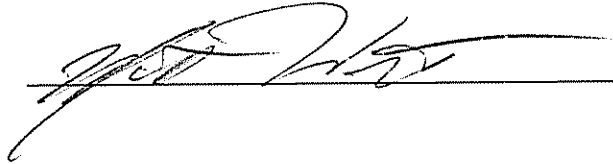
A handwritten signature in black ink, appearing to be "John P. [unclear]", is written over a horizontal line.

Exhibit A

Introduction

This project is a continuation of the on-going efforts between the Arizona Department of Transportation (ADOT), Arizona State University and the local industry to build a database of typical engineering properties for Portland Cement Concrete (PCC) mixtures used in Arizona. One goal of this effort is to advance the engineering technology and implementation of PCC projects through well-defined research and special laboratory testing activities. These activities support paving processes that combine laboratory research and field performance to ascertain the quality of PCC pavement construction.

Study Objective

The objective of this study is to conduct a laboratory experimental program to obtain typical engineering material properties for ADOT's Ultra Thin Whitetopping concrete test sections located in Sunland Gin Road, Casa Grande – Tuscan Highway (I-10). The types of materials that are anticipated to be sampled from these test sections include: control (conventional mix), Polypropylene and Alkali resistant glass fibers mixes.

Testing Program

The testing program, shown in Table 1, is aimed at development and verification of the compressive and bending capacity of the concrete and other types of fiber reinforced concrete materials. The ASU Special Tests are included in the ADOT's advertisements for bids (Attachment A).

The mechanical testing and characterization tests will be conducted at the Mechanical Testing Laboratories of Arizona State University. Several load frames ranging from load capacities of 20-110 Kips and equipped with servohydraulic closed loop testing controllers are available. Closed loop testing allows monitoring and control of the response of a system during the test. The specimen deflection will be measured using linear variable differential transformers (LVDT).

Prismatic specimens, 102x102x457 mm, will be obtained from the test sections for three point bending tests. Cylindrical specimens, 75 mm in diameter and 150 mm long, will be used for compression tests. For the prismatic specimens, a 12.7 mm notch will be cut on the tensile face of the flexural test specimens. The notch will serve to localize the formation of the crack. The deformation across the tensile cracks will be measured and used as the feedback signal to the test machine.

In addition tests will be conducted to calculate the coefficient of thermal expansion of concrete specimens. This is viewed as very important task to obtain typical ADOT coefficient of thermal expansion that can be used as input for the 2002 Design Guide. By measuring the coefficient of thermal expansion, a methodology for the prediction of thermal stresses in concrete pavements will be developed. A series of restrained shrinkage specimens will be manufactured using the current mix designs. The response of concrete subjected to restrained shrinkage will be documented by monitoring the strain in the concrete samples as a function of time.

Table 1. Scope of the Testing Program

Test proposed	# of mixes	Thermal Property	Shrinkage test	Mechanical Properties		
Specimen Type		Thermal expansion test	Restrained shrinkage	Flexural test, Toughness	Compressive Stress-strain	Ring specimen
Specimen Size		4x8 in cylindrical	16 in diameter 2" thick	4x4x16 in	3x6 in cylindrical compression	18 in diameter, 3 inch thick
Properties measured		Coefficient of thermal expansion	Stress strain shrinkage and cracking potential	Stiffness, flexural strength, toughness, stress-crack opening relationship	Stiffness, compressive strength, toughness, stress-strain, Poisson's ratio, Strain softening parameters	Ductility, new ASTM procedure
Control	1	3 replicates	1 specimen	3 replicates	3 replicates	2 replicates
Control PP-FRC	1	3 replicates	1 specimen	3 replicates	3 replicates	2 replicates
AR Glass	1	3 replicates	1 specimen	3 replicates	3 replicates	2 replicates
Total Required		9	3	9	9	6

- PP-FRC, 3 kg/m³
- AR-Glass-FRC, 5 kg/m³

An experimental study will be also conducted to evaluate the restrained shrinkage cracking in plain and fiber reinforced concrete. A restrained shrinkage test configuration has been recently adopted to measure the susceptibility of concrete mixtures to cracking. This procedure is referred to as AASHTO PP34-99. The experiment utilizes a constant humidity chamber holding the restrained shrinkage specimens. The chamber is subjected to constant flow of air around the specimens. The strain in the restraining steel and the crack width in the concrete samples were monitored continuously. The experimentally obtained results are affected by geometry of the specimen, the humidity and shrinkage conditions, and the restraint offered by stiffness of the steel ring.

Final Report

Upon completion of all work activities, a written report detailing the results of the findings will be prepared and submitted. The project activities are anticipated to be completed within 12 months from the time the mixes are sampled by ASU.

Study Cost

The cost to conduct the work detailed in this proposal as outlined in ADOT's Advertisement for Bids is a lump sum of \$25,000 paid upon the completion of constructing and sampling the test sections.



TERRY GODDARD
ATTORNEY GENERAL

OFFICE OF THE ATTORNEY GENERAL
STATE OF ARIZONA

TRANSPORTATION SECTION
WRITER'S DIRECT NO: 602.542.8837

INTERGOVERNMENTAL AGREEMENT
DETERMINATION

A.G. Contract No. KR03-1408-TRN, an agreement between public agencies, has been reviewed pursuant to A.R.S. § 11-952, as amended, by the undersigned Assistant Attorney General who has determined that it is in the proper form and is within the powers and authority granted to the State of Arizona.

No opinion is expressed as to the authority of the remaining parties, other than the State or its agencies, to enter into said agreement.

Date: 31 March 2004

Terry Goddard
ATTORNEY GENERAL

A handwritten signature in black ink, reading "James R. Redpath", written over a horizontal line.

James R. Redpath
Assistant Attorney General
Transportation Section

JRR:djd:780214